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A Considerable Account touching Vegetable Excrefcencies, given by that Learned and Observing Gentleman, Mr. Martin Lister, in a Letter to the Publisher, of July 17. 1671. from York.

I Understand by yours of the 23th instant, that M. Ray cannot without much trouble retrieve the Letter, wherein I gave him formerly my opinion concerning *Vegetable Excrefcencies*; and yet not wholly to deny you the satisfaction of what you seem much to desire, I am willing to think again upon the same subject, at least to recollect part of my former thoughts, as my memory will serve me.

The occasion then of that Letter was upon the account given us by You in *Numb. 57*, of the opinion of the Italian *F. Redi*; *Viz.* that some live Plants or their Excrefcencies do truly generate some Insects. To which opinion of *F. Redi* I told my friend, as I remember, that I indeed had observed, that the By-fruits of some Vegetables, as of the *Oak* and *wild Rose*, for example, did grow up together with their respective worms in them from small beginnings to fair and large fruit, some of them emulating even the genuin off-spring of the plant,

——— *Et miratur non sua poma.*

And further, that I did believe, the worms were furnished with food in and from them; but not by any Navil-connexion, as that Author fancies, and which I said, to me was unintelligible, and that I should be glad of a notion, which might make out to me such monstrous relation, as half animal half vegetable, or which is all one, Vegetable vessels inserted into an animal, or, the contrary. Strange Oeconomy!

That it had never been my good fortune (what ever diligence I had used) to discern Eggs in the Center of *Galls*, but a worm constantly, even at the very first appearance, as near at least as my fortune led me. Yet I would not deny, but that diligence might one day discover the egg it self, which I was of opinion was affixed to or near the place by the parent-Insect, where the Gall rose.

That I ever found the worms in all the excrefcencies, that I had

had yet met with, perfectly at liberty ; and for the filaments, our Author mentions, it was very possible he might be mistaken, it being very hard, and a matter not yet treated of in any publick paper, which and what are the vessels that enter into the Texture of a Vegetable, as of a large Tree, for example ; much more hard would it be to say, this is a vessel in a small Gall. That there were many By-fruits of different figure and shape (though perhaps of a like Texture) upon one and the same plant, every one of which did nourish and produce a different race of Insects : Whence, I told him, I thought might rather be argued the diverse workmanship of different Insects, then one and the same principle of vegetation to be Author of several sorts of Animals.

That the Animals themselves, produced of such Excrescencies, were for the kind of such a race, as were well known to us to be otherwise generated of animal parents, and therefore it was probable, that these were so too, as well as their tribe-fellows.

That the Insect-Animals produced of such Excrescencies were male and female ; and that, if so, we might argue with *Aristotle* (lib. I. c. 1. *de Generat. Animal.*) that Nature made not such in vain, and that, if from the coit of these Animals, which have their birth from no Animals, Animals should be born, they would *either* be like their parents and of the same species with them, and if so, it would necessarily follow (since in the generation of all other creatures it so comes to pass) that their very parents had such origin too : *or* unlike them, and if so (if these also were male and female) of this second unlike off-spring a third race of different animals or *species* would be begot, and of them a fourth, and so *in infinitum*. And that these Insects, which he and I had observed to be produced of the Excrescencies of some vegetables, we had good cause to suspect they were male and female, since some of them had stings and were tripilous, and others not (*vide Catalog. plant. Cantab. ad Rosam caninam & alibi.*)

These were some at least of the Arguments, as far as I remember, I used, when I formerly wrote on this subject to my friend ; but since that Letter, I have perused the Book of *F. Redi* it self, and do find, that the said opinion is barely proposed as a thing not unplaussible, but the proofs thereof are reserved,

till the publishing of a curious piece, concerning the *Excrefcencies* of the *Oak*; and therefore I ſhall be leſs earneſt in the refutation of that opinion, which perhaps a more accurate ſearch into Nature will in time make the Author of it himſelf find erroneous.

I preſume not to venture to decide this controverſy, my experience in theſe matters being too inſufficient, and my leiſure and health but little to haſten a convenient ſtock of particulars, and a due examination of them; yet before I leave this ſubject, I am willing to run over and preſent you with a few abbreviated inſtances of ſome of the ſeveral kinds of Vegetable Excreſcencies, and likewiſe ſome un-obvious ways of Inſects feeding on plants; and theſe I ſhall deliver in confirmation of the following Propoſitions.

1. That all are not truly Vegetable Excreſcencies that are reputed ſuch. And here we may juſtly name the *Purple-Kermes*, for example, whoſe hiſtory you were pleaſed to publiſh in *Numb. 73*. This, I ſay, both gives a clear light to the diſcovery of the nature of the *Scarlet-Kermes*, (a thing wholly unknown to the Ancients, as far as we can ſee by their writings, and no leſs ignored by the moderns, and yet, which is admirable, in very great eſteem and continued in uſe for ſome thouſands of years,) and alſo is an evident inſtance, that ſome things, confidently believed Vegetable Excreſcencies, are no ſuch matter, but Artificial things merely contiguous to the plant, and which have no other relation to it than the *patella*-ſhell-fiſh to the Rock it cleaves.

2. Generally, Inſect Eggs laid upon the leaves of plants, or their reſpective worms feeding on them do not occaſion or raiſe Excreſcencies. This truth every body, that hath been the leaſt curious, is an Eye-witneſs of. Thus, for example, the Eggs of the common *Red butter-fly*, laid upon the Nettle, are thereon hatched without bliſtering the plant into an Excreſcence, and the ſtiff haired or prickly *Caterpillars* hatched from them Eggs, feed upon the leaves without any ill impreſſion, puncture, or prejudice, ſave that they make clean work, and eat all before them. I could produce ſome hundreds of inſtances, if this were to be doubted of.

3. Some Inſect-eggs, laid upon the leaves or other parts of plants, do, as ſoon as hatched, pierce and enter within the plant

plant to feed. To give you a convincing instance to the truth of this proposition, take this from my notes.

May 22, I observed on the back or underside of the leaves of *Atriplex olida*, certain small milk-white oblong Eggs, on some leaves four, on others fewer, or more; these Eggs were on some plants yet unhatched, but on many of the same plants I found the Egg-shells or skins yet adhering to the leaves, and the little maggots already entered (through I know not what invisible holes) within the two membranes of the leaf, and feeding on the inward pulp or substance of the leaf: in other leaves of that plant, (he that shall make the observation after me, will find plants enough of this *species* seized on, to vary, as I did, the observation in one day,) I found those maggots grown very great, and yet the two membranes, that is, the uppermost and undermost skin of the leaf, entire, but raised and hollow like a bladder. Note 1. That those maggots were of a Conick shape. 2. That in July they shrunk into *Fly Chrysalis's*, and accordingly came to perfection, &c. To this unobvious way of feeding we think we may refer all worm-eaten fruits, woods, &c.

4. Worms feeding within some of the parts of some plants do cause Excrescencies. Thus the heads or seed-vessels of *Papaver*, *Spart*, *Sylv*, *Ger*, *Emac*, &c. are disfigured for having worms in them, and grow thrice as big, as the not sealed ones. This is also plain in the Excresc. of *Pseudo teucrium*, and *Barbarea*, &c.

5. The substance of most Vegetable Excrescencies is not the food of the worms to be found in them. The instances given in confirmation of the last proposition do also confirm this: neither is an *Oak-apple* properly worm-eaten, or the *Shagged Galls*, or *Sponges* of the *Wild Rose*, or the *Smooth* ones on the leaves of the same plant, or the *Baggs* upon the leaves of the *yellow dwarf Willow* or the *Elm*, &c.

This is the sum of what I have to say at present concerning this subject, being very unwilling to advance further, than my own private observations will suffer me.